X.—Tasks and System of Work

49. The setting out of the tasks must be done well in advance of the workers and with the following objects in view :—

(i) to give every one sufficient room to work in ;

(ii) to give *at least* four days' work to a gang in the same place ; and

(iii) in the case of earth-work, to admit of the *whole* of the excavation in each burrow-pit in progress being measured up daily until it is completed ; the wages due for the day can then be calculated by deducting wages already paid from the total amount due for the whole excavation. (This is necessary as it is impossible to make accurate measurements of each day's work separately.)

50. The tasks for earthwork, murum, metal and gravel collection should be as given in Tables A to D of this Appendix. The system followed on these works should be the same as is usually adopted on Public Works Department works of the same nature.

51. For metal breaking the task should vary for B, C and D class workers from 5½, 4 and 2½ c.ft. to 4½, 3 and 1½ c.ft. according to the nature of the stone which is being broken. For the stone generally used for road metal, a task of 5, 3½ and 2 c.ft. is suitable. The task should include fetching blocks from the dump, and stacking the metal broken at the end of the day.

52. The stone must be broken into cubes and be free of chips and debris. The cubes should be good hard quality and should pass in any direction through a 2″ ring. Iron rings of this size must be supplied to the workers in sufficient numbers to allow of all learning what the size of the metal should be.

53. Blocks of stone from 5″ to 8″ thick suitable for breaking into metal should be supplied on a dump immediately adjoining the metal breaking ground, from which the breakers should take supplies as required by them. The blasting and quarrying of the blocks should be done by contract, and special gangs should be appointed to carry the blocks from the quarry to the dump consisting of C and D class workers who should be paid daily wages at the rate prevailing in the neighbourhood in normal times. Carriers who are found to be persistently shirking a reasonable day's work should be transferred to a metal breaking gang.

54. The metal broken by each gang should be measured daily and then transferred to a stack. There should be a separate stack for each gang. All stacks should be of uniform dimensions and so formed as to take the total metal broken by one gang in a week. A stone should be erected just in front of each stack at one end of it on which should be inscribed the number of the gang by which, and the dates between which, the metal was broken.

XI.—Muster-rolls, Payment of Wages and Routine

55. After a gang has been formed and entered in a muster-roll, no addition to a muster-roll may be made except under the initials of the Charge Officer, who should also place his initials at foot of each class when the muster-roll is first brought into use. He should check a few gangs almost daily and place his initials below the day's entries under each class after doing so. Every inspecting officer should do the same. The muster-roll should be totalled by the mustering karkun, both morning and afternoon, directly after the roll has been called, the morning's total being placed above the afternoon's, thus $\frac{8}{8}\frac{0}{4}$. All entries must be in ink. A person absent in the morning will have a O placed against his name. If he be present in the afternoon a stroke will be drawn across this O mark from right to left—thus ⊘ ; a person present at both roll calls will be marked thus × ; while a person present at neither shall be marked thus ⊙. Presence in the morning and absence in the afternoon shall be denoted by ⊘. The mean of the morning's and afternoon's totals represent the average number present for the day. The morning call should ordinarily be taken at 8 A.M. and the afternoon at 3 P.M.

56. The Charge Officer should arrange to have the mustering karkuns drilled in their duties for a few days before being put in charge of gangs. The gangs should range themselves for being mustered in the order in which their names appear in the rolls and they should be instructed to repeat their fathers' names when their own are read out, instead of calling out "hazar." This tends to prevent personation.

The Gang book in Form 12 should be maintained on every work so as to keep a record of the work done and to exercise a useful check on fictitious gangs. A counterfoil of the book should be kept posted on the gang board so that any visitor or inspecting officer can easily check the constitution of the gang and its work.

57. Each gang's daily wages will be put by the sub-cashier into a bag with the gang number marked plainly on the outside. The mustering karkun will assist the ganger in distributing the wages as far as may be necessary. From his own abstract he knows how much each gang has earned and he will, therefore, when handing over the

(*c*) READY RECKONER FOR GRAIN AND CASH DOLE

(*See* Section 110 of the Code)

N.B.—Where the fractions are in excess of half a pie full one pie should be taken into account and where they are less than that they should be omitted.

For lbs.	⅛	¼	½	1	2	4	8	10	100	1,000
At lbs. per rupee.	Pies.	Pies.	as. p.	as. p.	as. p.	as. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
6	4	8	1 4	2 8	5 4	10 8	1 5 4	1 10 8	16 10 8	166 10 8
6½	$3\frac{9}{13}$	$7\frac{5}{13}$	1 $2\frac{10}{13}$	2 $5\frac{7}{13}$	4 $11\frac{1}{13}$	9 $10\frac{2}{13}$	1 3 $8\frac{4}{13}$	1 8 $7\frac{5}{13}$	15 6 $11\frac{1}{13}$	153 13 $6\frac{6}{13}$
7	$3\frac{3}{7}$	$6\frac{6}{7}$	1 $1\frac{5}{7}$	2 $3\frac{3}{7}$	4 $6\frac{6}{7}$	9 $1\frac{5}{7}$	1 2 $3\frac{3}{7}$	1 6 $10\frac{2}{7}$	14 4 $6\frac{6}{7}$	142 13 $8\frac{4}{7}$
7½	$3\frac{1}{5}$	$6\frac{2}{5}$	1 $0\frac{4}{5}$	2 $1\frac{3}{5}$	4 $3\frac{1}{5}$	8 $6\frac{2}{5}$	1 1 $0\frac{4}{5}$	1 5 4	13 5 4	133 5 4
8	3	6	1 0	2 0	4 0	8 0	1 0 0	1 4 0	12 8 0	125 0 0
8½	$2\frac{14}{17}$	$5\frac{14}{17}$	0 $11\frac{5}{17}$	1 $10\frac{10}{17}$	3 $9\frac{3}{17}$	7 $6\frac{6}{17}$	0 15 $\frac{12}{17}$	1 2 $9\frac{15}{17}$	11 12 $2\frac{14}{17}$	117 10 $4\frac{4}{17}$
9	$2\frac{2}{3}$	$5\frac{1}{3}$	0 $10\frac{2}{3}$	1 $9\frac{1}{3}$	3 $6\frac{2}{3}$	7 $1\frac{1}{3}$	0 14 $2\frac{2}{3}$	1 1 $9\frac{1}{3}$	11 1 $9\frac{1}{3}$	111 1 $9\frac{1}{3}$
9½	$2\frac{10}{19}$	$5\frac{1}{19}$	0 $10\frac{2}{19}$	1 $8\frac{4}{19}$	3 $4\frac{8}{19}$	6 $8\frac{16}{19}$	0 13 $5\frac{13}{19}$	1 0 $10\frac{2}{19}$	10 8 $5\frac{1}{19}$	105 4 $2\frac{10}{19}$
10	$2\frac{2}{5}$	$4\frac{4}{5}$	0 $9\frac{3}{5}$	1 $7\frac{1}{5}$	3 $2\frac{2}{5}$	6 $4\frac{4}{5}$	0 12 $9\frac{3}{5}$	1 0 0	10 0 0	100 0 0
10½	$2\frac{2}{7}$	$4\frac{4}{7}$	0 $9\frac{1}{7}$	1 $6\frac{2}{7}$	3 $0\frac{4}{7}$	6 $1\frac{1}{7}$	0 12 $2\frac{2}{7}$	0 15 $2\frac{6}{7}$	9 8 $4\frac{4}{7}$	95 3 $9\frac{5}{7}$
11	$2\frac{2}{11}$	$4\frac{4}{11}$	0 $8\frac{8}{11}$	1 $5\frac{5}{11}$	2 $10\frac{10}{11}$	5 $9\frac{9}{11}$	0 11 $7\frac{7}{11}$	0 14 $6\frac{6}{11}$	9 1 $5\frac{5}{11}$	90 14 $6\frac{6}{11}$
11½	$2\frac{2}{23}$	$4\frac{4}{23}$	0 $8\frac{8}{23}$	1 $4\frac{16}{23}$	2 $9\frac{9}{23}$	5 $6\frac{18}{23}$	0 11 $1\frac{13}{23}$	0 13 $10\frac{22}{23}$	8 11 $1\frac{13}{23}$	86 15 $3\frac{15}{23}$
2	2	4	0 8	1 4	2 8	5 4	0 10 8	0 13 4	8 5 4	83 5 4
12½	$1\frac{23}{25}$	$3\frac{21}{25}$	0 $7\frac{17}{25}$	1 $3\frac{9}{25}$	2 $6\frac{18}{25}$	5 $1\frac{11}{25}$	0 10 $2\frac{22}{25}$	0 12 $9\frac{3}{25}$	8 0 0	80 0 0
13	$1\frac{11}{13}$	$3\frac{9}{13}$	0 $7\frac{5}{13}$	1 $2\frac{10}{13}$	2 $5\frac{7}{13}$	4 $11\frac{1}{13}$	0 9 $10\frac{2}{13}$	0 12 $3\frac{9}{13}$	7 11 $0\frac{12}{13}$	76 14 $9\frac{8}{13}$

APPENDIX IV

Scarcity Works

(*See* Chapter VI of the Code)

Scarcity works should serve as a prophylactic measure against distress rather than as a test of the actual existence of distress. By increasing the demand for labour in the area affected, distress should be palliated before it has reached an acute stage. At the same time in all districts where the people are accustomed to migrate to places where labour is always in demand, care should be taken not to open scarcity works too early and thereby possibly encourage the people to stay at home rather than to migrate. In such districts scarcity works should be opened after the Collector is satisfied that all the able-bodied workers who can migrate and obtain labour elsewhere have done so, in order to provide employment for those who for good reasons cannot migrate and require work near their homes. The programmes of scarcity works should include such works only as are of real economic value. Mainly they will consist of repairs and improvements of existing roads, the aim being to raise the standard of existing communications, as the opportunity occurs, by improving the surfaces of roads, realigning them where necessary, building causeways over *nalas* and culverts, and effecting other real improvements. The building of causeways and culverts may be undertaken as it affords relief both to unskilled labour and to a class of artisans who are often hard-pressed in times of scarcity. The works should be carried out as far as possible in the order in which the various repairs and improvements are required. In preparing the programmes of scarcity works the probable increase in heavy motor traffic in the future should be borne in mind.

2. The management of District Local Board and Municipal scarcity works should be left to the Local Boards and Municipalities concerned subject to the rules contained in Chapter VI of the Code. The Collector and the Executive Engineer should inspect them periodically and the Collector should arrange for their inspection by other officers under section 44 of the Code. Inspecting officers should especially satisfy themselves that they are being conducted in such a manner as to justify any claim to a grant from Government under section 55 (*c*) of the Code.

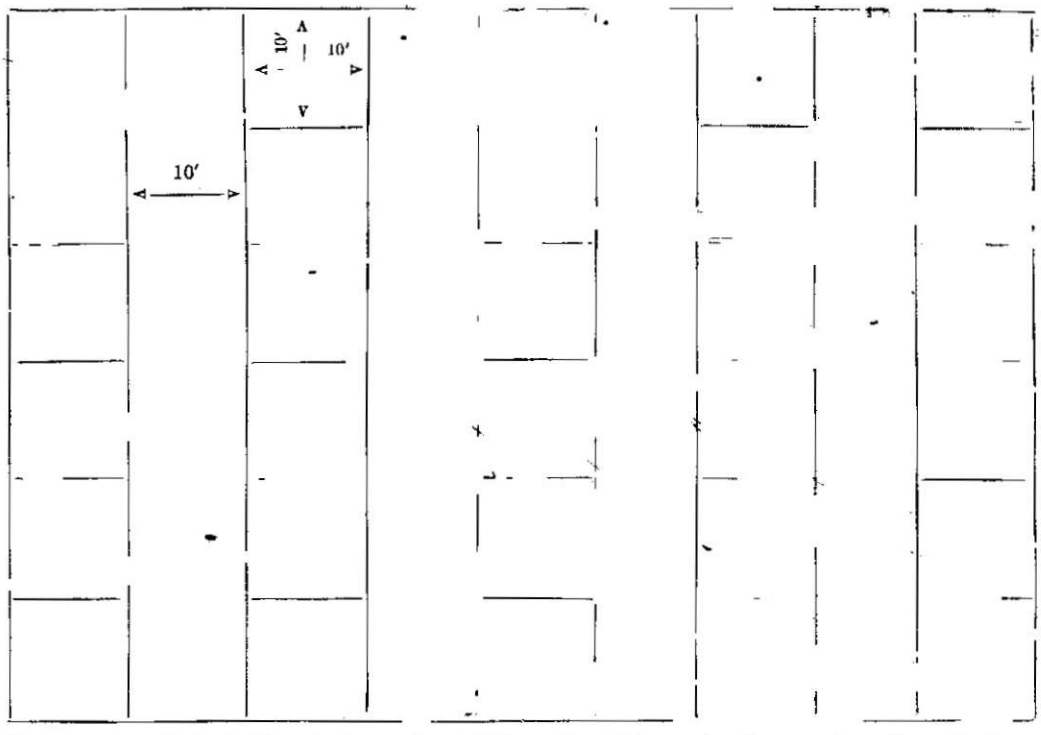
3. Scarcity works in charge of the Public Works Department should be conducted in the same way as ordinary departmental works subject to the provisions contained in Chapter VI of the Code.

4. Village works will ordinarily only be required in the districts of Ahmedabad, Kaira, Broach and the Panch Mahals, where the public works are not numerous and do not admit of any considerable expansion. They will generally consist of the clearance of silt from village tanks and the improvement of country tracks. Such works are seldom of any great economic value to the district, but in the absence of public works, there is no alternative but to undertake them. But care must be taken to see that any demand raised for such works is a genuine one, and not merely in order to get a work done which the people of a particular village want, and which no other people from neighbouring villages will attend. Whether the demand is genuine or not can generally be tested by watching the movement of labour as soon as a work is finished. If the people who have been working on it refuse to walk a few miles in order to attend a new work which has been opened, and the latter is only attended by the people of the village in which it is situated, the natural assumption is that village works are not really required at all and the Collector should then close them altogether.

5. The following provisions as to measurement on village works and apportionment of work to the gangs will be found useful by officers of the Revenue Department in the management of such works :—

(1) The system of measurement on village works should be such that the manager will be able to do most of the work himself, without the assistance of a measuring staff. The digging and embanking of tanks, clearing of sites, removing of prickly pear, &c., is the most suitable form of labour for such works.

(2) *Tank Works.*—The ground to be excavated should be first laid out in rows of squares 10 feet × 10 feet, running the full length of the embankment, with a path 10 feet in width leading to the embankment between each row of squares, as shown below :—



Squares should be laid out along the *full* length of the embankment in order that as much excavation as possible may be done at short leads before going on to the longer leads. The squares should be laid out by means of bamboos each 10 feet long (the bamboos should also be marked in quarter lengths for the purpose of afterwards measuring the work done). Each square when dug to the depth of one foot will represent 100 cubic feet of work. After two adjacent rows of squares have been excavated, the intermediate path should be similarly divided into 10 feet × 10 feet squares for excavation.

(3) As people arrive for admission to the work the manager will inform them of the payment allowed for one, two or more complete squares of 100 cubic feet and will order them to form themselves into gangs, each of which will elect its own headman or ganger. The gangs will be small or large according as the leads are short or long and the manager will arrange that they contain proper proportions of diggers, carriers and children.

(4) As soon as a square has been completed and paid for, the earthen pillar left in the centre of each to show the depth it has been dug shall be removed.

APPENDIX V

(*See* note to Chapter VII)

Management of Relief Works

The duties of the Executive Engineer and his subordinates in connection with public works fall under the following heads:—

	Paragraphs
I.—General organization and establishment	... 1—14
II.—Equipment of a charge	... 15—16
III.—Supply of small coin	... 17—18
IV.—Water-supply	... 19—24
V.—Hutting and conservancy	... 25—31
VI.—Hospitals	... 32—36
VII.—Market arrangements	... 37
VIII.—Destruction of flies	... 38—43
IX.—Organization of relief labour—The gang	... 44—48
X.—Tasks and systems of work	... 49—54
XI.—Muster-rolls, payment of wages and routine	... 55—63
XII.—Duties of Inspecting Officers	... 64

I.—General Organization and Establishment

1. A charge will contain, approximately, 5,000 workers together with perhaps 1,500 dependents, making altogether 6,500 persons. When the number of workers in a charge reaches 6,000 further admission to it must at once cease, a fresh charge being opened if necessary. The old charge will be called a "closed charge" until its numbers have fallen sufficiently to permit of admission to it being reopened. The new charge may be on a different part of the same work or on another work at no great distance. But its equipment and establishment must be distinct and complete in themselves.

2. The complete staff for a charge will ordinarily be as follows:—

Nos.	Designation.	Monthly pay.	Remarks.
		Rs.	
1	Charge Officer ...	125 to 200	Pay to be fixed by the Collector; should furnish security for Rs. 1,000.
1	Sub-overseer ...	100 to 125	May be on the permanent staff of the Public Works Department.
3 to 5	Work agents ...	50 to 75	Of the maistri or sub-overseer class.
2 to 3	Checking karkuns ...	35 to 50	
16 to 20	Mustering karkuns ...	25 to 35	Including those employed in the kitchen and in charge of water and conservancy parties and on accounts.
1	Storekeeper ...	30 to 45	Should furnish security up to Rs. 200.
1	Office clerk ...	40 to 50	
2	Sub-cashiers ...	40 to 60	Should furnish security up to Rs. 300 each.
1	Camp superintendent.	35 to 45	
1	Kitchen superintendent.	35 to 45	Should furnish security up to Rs. 200.

NOTES.—(1) The Executive Engineer will appoint the above with the exception of the Charge Officer, who also may occasionally be appointed by him with the Collector's approval. Chaukidars, peons, sweepers, &c., as may be required, are to be taken as far as possible from amongst the relief workers.

(2) It will be the duty of inspecting officers to see that no part of the establishment is in excess of requirements, as well as to take care that it is sufficiently strong and efficient for its purpose.

3. The duties of the *Charge Officer* are described in section 85 of the Code; he will be general superviser and cashier on the spot. It is most important that the best men available from any Department should be selected for these posts; active men are necessary and therefore, as a rule, ministerial officers will be unsuitable. The pay should be such as to attract men of the right stamp and should in no case be less than Rs. 125 per mensem, with a conveyance allowance up to Rs. 45, if necessary. It is often a good plan to promise a monthly increment of salary, conditional on the satisfactory discharge of duties.

4. The *work agents* will work under the immediate orders of the sub-overseer. Their duties will be to lay out the work in advance, to set up profiles as a guide to the workers where necessary, to measure up the work done by each gang and enter it in the muster-roll (Form 11), at the same time calculating and entering therein the wages payable. They will also pay attention to the proper finishing up of the work, employing separate gangs of trained workers for this purpose. If the Charge Officer finds that his establishment is insufficient or not efficient enough to cope with this portion of the work, he should at once make a report to the Executive Engineer, sending a copy of the report to the Public Works Sub-Divisional Officer at the same time.

5. Where tasks are not uniform, *e.g.*, where the character of the soil varies greatly, as in the depth of a substratum of murum, the measuring staff must be strengthened beyond what is necessary when tasks are uniform. It cannot be too strongly insisted on that if frauds are to be prevented and wages paid with regularity, measurements must be made quickly. In making them, complete mathematical accuracy is not required, but each gang must know exactly what they have to do to earn the full wage.

6. The duties of the *mustering karkun* are to muster his gangs, which shall ordinarily be five in number, morning and evening, to maintain order and to see that each worker has a fair chance of earning the full wage. He should bring to the notice of the Charge Officer any failure on the part of the work agents to set out the tasks beforehand. The actual counting out and distribution amongst the gangs of the wages, as received from the sub-cashier, will also be part of his duties.

7. The duties of the *checking karkuns* will be to check, before payment, the calculations in the muster-rolls and other forms kept by the mustering karkuns and to see that they are properly maintained; to instruct the mustering karkuns in their duties and keep them up to them; to assist, as required, at the distribution of wages; to help the office clerk in checking the various accounts after payment; and generally to assist the Charge Officer in checking all payments and accounts.

8. The duties of the *camp superintendent* will be to supervise the water supply and conservancy arrangements. He should also be called upon to be present daily at the time of payment of wages and to help to check fraud. If his duties are otherwise heavy he may be given one or more assistants. He and his assistants should be authorized to check muster-rolls. Intelligent non-commissioned officers of Indian regiments, either on the active list or pensioned, are the best men for the post, and should always be appointed when available.

9. The *storekeeper's* duties will be to receive and issue all articles of tools and plant, stores, &c., taking a receipt for every article issued and keeping a detailed account of all receipts and issues. The mustering karkuns and the gangers under them will be held responsible for the tools issued to them. All tools should be stamped before despatch to the work.

10. Arrangements for a smith's shop for the repair of tools and for a couple of carpenters to prepare and repair tool-handles will be necessary. The work of sharpening or repointing pickaxes should be given out at piecework rates. A head sweeper should be placed in charge of the conservancy gang.

11. The *ganger's* duties have already been described in Chapter VII of the Code.

12. In close proximity to the head-quarter camp and the tool enclosure will be the *police guard*. The treasure chests should always be placed in custody of the guard at night. The strength of the guard will ordinarily be one head constable and four constables. They should be hutted near the guard-room. Their duties, in addition to guarding the treasure chests both day and night, will consist in helping to keep order in the camp and in the bazar and in carrying out such detailed orders as the District Magistrate and the District Superintendent of Police may issue.

13. The *Public Works Sub-Divisional Officer* will exercise control, through the Charge Officer, over the whole of the establishment employed on a relief charge. His particular duties will be to correct all faults in organization—paying especial attention to the proportion of carriers to diggers; testing the quantity and quality of the work done; checking the numbers on the work and the payments made; assisting in aligning new works; and doing all he can to cause the work to proceed smoothly and to be carried out efficiently and economically, by instructing the establishment in their duties and keeping them up to them. He should take measures to get rid of persons on the establishment

whom he finds to be inefficient, reporting to the Executive Engineer when necessary. All important orders he may give should be entered in an order book to be kept on the work in charge of the Charge Officer, who should, when this is necessary, forward copies to the Executive Engineer. The order book should be kept distinct from the inspection book, in the latter being entered the remarks and orders of inspecting officers only.

14. The Charge Officer should keep all orders received by him from the Collector in regard to the price-basis in a separate file, in order that the necessary information may be readily available at times of inspection. These orders will specify the date from which any change in the price-basis is to take effect on the work.

II.—Equipment of a Charge

15. On receiving intimation from the Executive Engineer that a new relief charge is about to be opened, the Public Works Sub-Divisional Officer should *at once* forward to that officer an indent for such tools and plant, office furniture, stores, &c., as he judges will be necessary and which he cannot himself supply from the sub-divisional stores, or obtain more economically locally. The following statement gives a rough idea of what may be necessary; but the actual requirements should be carefully considered in each case before indenting:—

1,000 Pickaxes.
2,500 *Pavras or kodalis.*
5,000 Stone-breaking hammers.
200 *Sutkis.*
100 Sledge hammers.
500 Mining bars.
100 Iron rammers.
6,000 Baskets.
12 Galvanized iron buckets.
25 Axes.
15 Iron buckets (*dols*).
200 Iron water pots.
50 Water casks.
4 Treasure chests (2 large and 2 small) with a good lock to each.
10 Measuring tapes, 50 feet.
100 Five feet measurement bamboos.
3 Beam scales and weights.
1 Maund country twine.
10 Maunds coir string.
Cloth for flags—
red for admission stations;
blue for water;
yellow for conservancy;
white for gangs and gangers.
10 Tape belts for peons.
1 Office time-piece.
5 Office tables.
5 Office chairs.
5 Karkuns' desks.
1 *Jajam* (office carpet).
10 Net money bags.
16 Canvas money bags.
100 Kharwa cloth bags (for distribution of wages to gangs).
5,000 Kitchen tickets.
100 Muster-roll tins.
Forms and stationery.

16. After the opening of the work the Charge Officer should, in consultation with the Public Works Department Sub-Divisional Officer, similarly indent direct on the Executive Engineer, from time to time, for such additional tools, stores, &c., as are required and which cannot be purchased locally with advantage. The usual public works requisition form (kept in counterfoil) will be used for this purpose.

III.—Supply of Small Coin

17. The Collector will, at the commencement of operations, make arrangements for a supply of small coin in sub-treasuries equal to three weeks' estimated requirements. The Charge Officer will subsequently arrange to collect the small coin in circulation in the bazar on the work or in the nearest market town, in exchange for rupees brought from the treasury. If he finds legal tender copper coin circulating at a discount or at a premium, he should at once report the circumstances to the Collector, through the Executive Engineer.

18. The Charge Officer will ordinarily cash all cheques drawn by him at the sub-treasury. If in an urgent case he has to obtain cash for a cheque from a respectable dealer with whom he is acquainted, he must not pay or receive commission on the transaction.

IV.—Water-supply

19. It is impossible to prescribe any one detailed system of water-supply which will be suited to local conditions everywhere. The important points to be attended to in all cases are:—

(i) that all water sources, except those approved for the supply of the camp, should be strictly closed to general use, being fenced off and guarded;

(ii) that the drawing of water from the approved sources should be done solely by a special staff of drawers, no other persons being permitted to dip their vessels into the source and draw water;

(iii) that the relief workers, &c., should bring their own water pots to a place near the source, where water will be poured into their pots by the drawers either from troughs, cisterns or channels or by direct pouring;

(iv) that special care should be taken to drain off waste water and to prevent it soaking back into the source.

20. For drawing water iron buckets or kerosene tins, strengthened with an iron strap round the top and furnished with an iron handle, will be required. Distribution may be effected in several ways, *e.g.*—

(*a*) by a number of ducts radiating from the well: these may be made of tin, galvanized iron or the hollowed out stem of a palm tree cut in half longwise, the drawer pouring in water at one end as he draws it, and the workers holding their pots under the other end;

(*b*) by making an earthen trough or channel, paved with stone or gravel, above the level of the surrounding ground—this trough or channel being filled by the drawers, and the water being distributed from spouts or other openings in it;

(*c*) by putting up stone or even iron cisterns, which the drawers would keep filled and from which water would be given to the people either from spouts or by the drawers dipping kerosene tins and pouring the water direct into the people's pots (these cisterns are more appropriate on works which are expected to continue open for some months).

Water should also be distributed from carts or otherwise up and down the work during working hours. When the water supply is distant from the works, water carrying gangs may be formed and tasks prescribed for them.

21. Unless there is absolutely no other source available, water should never be taken from pools or tanks or from any source which cannot be efficiently protected from contamination or disinfected if it has become contaminated. As far as possible wells, with a properly constructed masonry lining above the rock or murum in which they stand, should be selected. They should be fenced in and no washing permitted within 100 yards; the enclosed area, within which the drawers work, should be either roughly paved with flat-bedded stones or covered with a good layer of gravel or coarse sand. The buckets, tins, cisterns, channels, &c., used in distribution should all be kept scrupulously clean, all vessels being scoured with clean sand daily.

22. All wells in use should be disinfected with permanganate of potash* or chlorate of lime at least once a week. This should be done in the evening after work closes. Two ounces of permanganate of potash should be used for an average sized well. The exact quantity necessary can be judged by observing the colour of the water 15 minutes after disinfection. It will have a deep rose tint. The purer the water the deeper the tint. A fourth part of the quantity of permanganate to be used should be placed in a bucket, which should be then lowered into the well and agitated in the water by alternately lowering and lifting until all the salt has dissolved and become diffused throughout the well. The other three parts should then be separately and similarly dissolved. Successful disinfection will have been attained if the water shows a faint tinge of pink colour early next morning. Failing this, or if the tinge be brown instead of pink, the process should be repeated that evening, using half the previous quantity of salt, and so on until the desired result is attained. When cholera is about, the disinfection process should be repeated every four or five days. This treatment destroys the organic matter in the water on which the cholera germ lives. Any fish, &c., killed in the process should be promptly removed.

23. (*a*) The use of Nesfield's method of chemical sterilization is efficacious though expensive. Sterilization depends on the liberation of free iodine, but free chlorine is just as efficient and very much cheaper and easier to use.

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* Permanganate of potash for use in disinfecting wells should always be issued ready made up in 2 oz. packets. These packets may be conveniently packed 40 in a box, which will thus contain 5 lbs. For instructions regarding the storage of permanganate of potash, *see* Appendix VII.

The essentials are :—

(i) A hand pump, or a mechanically driven pump,

(ii) two tanks, with capacity in accordance with the size of the camp,

(iii) a short length of piping with a few taps,

(iv) one Professor Cree Brown's three-way stop-cock [described in Appendix VII B],

(v) water carts to carry water to the work.

When the source of water is from a well in which the water level is more than 20' from the surface and, if it is impossible to get a petrol or oil-engine-pump, it may be necessary to arrange for drawing the water from the well to a tank (masonry or metal) at the mouth of the well by means of a *mote* and hand-pumping it from there to the sterilization tanks. The height of the tanks above the mouth of the well will depend on the head necessary. If no other support is available, a mound of earth would suffice.

The capacity of the tanks will depend on the population to be served and the quantity of water considered necessary per head. One gallon per head is probably the minimum necessary for cooking and drinking. To allow for personal ablution, washing of clothes and cleansing of utensils, 1½ to 2 gallons should be provided, if the water can be obtained.

For a camp of 1,000 persons one tank of 2,000 gallons capacity, or 8′ × 8′ × 5′, will be required, and a second tank of approximately 500 gallons capacity, the depth of this second tank to be in accordance with the length of the glass tube attached to Professor Cree Brown's three-way cock. The second tank should be raised over the first tank and the three-way cock attached to it. The dose of clorine required could be estimated daily by the Medical Officer in charge of the camp.

By this method of disinfection river water and even tank water can be used with comparative safety.

24. Where regularly constructed wells do not exist, temporary ones can often be sunk in a *nala* or river-bed. These should be as strictly guarded as regular wells. Very great care in securing the water-course from contamination is, however, necessary in this case.

V.—Hutting and Conservancy

25. When it is necessary to hut any of the relief workers at Government expense, the huts should be made as cheaply as possible and gangs of workers employed for their construction. The site chosen should be elevated and well drained, but not too far from the water-supply. If it stands on black soil it may be necessary during the rains to provide a floor of murum in each hut. The hut itself should be 9 feet long by 6 feet wide and 4½ feet high to ridge. It should generally be open in front and closed at the rear, and should face the direction towards which the prevailing wind blows so as to shelter the cooking places in front from the wind. The frame-work of the hut should consist of two pairs of light bamboos, crossed and with their lower ends embedded in the ground ; a fifth bamboo will form the ridge. The sides will generally consist of matting or of "gunny" cloth with an additional piece tied over the top. Each such hut will contain an ordinary family. The huts should be arranged in rows and in groups of five, with a clear width of 4 feet between adjacent huts. There should be a 20 feet roadway between each group and a 50 feet roadway parallel to each row of huts. The occupants should not be allowed to cook inside the huts in the fair season. The huts need not be made watertight. The camp site should be swept out daily and no one allowed to stay in the camp during working hours except the temporarily indisposed whose removal to hospital is not necessary. Continuous drainage trenches should be dug in front of and behind each row of huts and cross trenches to the extent found necessary.

26. Latrine arrangements are referred to in section 87 of the Code. A site not nearer than 200 yards from any well or water-supply, and, if practicable, not on the watershed of any tank, either existing or in process of construction, should be chosen, to leeward of the lines, for the latrines. Wherever the soil will admit of it, long trenches, one foot in depth, should be dug every day; these trenches should be made for one day in advance of what is required, but each day's ordure must be covered in before night. Separate trenches should be set apart for men and women respectively. The labourers should be ordered to kick, after defæcation, some of the earth excavated from the trench into it ; but a labourer must be constantly in attendence to cover the ordure with earth : this can be done with a long rake, and the labourers need never touch the night soil. *Nalas* must on no account be used for latrines. If the soil is rocky and will not admit of the excavation of trenches or if there is not sufficient earth for the purpose, the people must be allowed to ease themselves over a selected site to leeward of and not nearer than 200 yards from the lines ; the ordure must be daily collected and

thrown into a pit ten feet deep; and it must be covered every day with earth or ashes. Latrine sites must always be marked off with yellow flags, and any person easing himself in any place outside the flags should be punished.

27. Kitchen latrines should be in direct communication with the kitchen enclosure, from which they should be distant about 30 yards and connected therewith by a lane, fenced on either side; for the adult dependents there should be trench latrines and for the children ground latrines, consisting simply of a 6" layer of loose earth, which will be removed with the ordure and replaced every evening with sweet earth.

28. A suitable burial ground, with a good depth of soil and as high and as well drained as possible, should be selected at a distance of about half a mile from the central camp or any village. It must not be on the bank of, or near, any water-course or tank. The graves should be dug at least 5 feet deep and 4 feet apart in any direction. In epidemics the graves may be deeper so as to take more than one corpse; but in this case there must not be less than a 4 feet depth of soil over the topmost body. A sufficeint number of graves must always be kept ready dug so as to prevent any delay in burying corpses.

29. In epidemics endeavour should be made to arrange for the burning of the corpses in all cases in which there is no religious objection and firewood is procurable.

30. The hut in which a case of epidemic disease has occurred should always be burnt, and those near it evacuated. Soiled clothing which has come in contact with the person seized should also be burnt under the orders of the Charge Officer, with the approval of the medical officer, on payment of fair compensation.

31. When a camp is threatened by an epidemic of cholera or other disease, a corps of stretcher-bearers to search out and remove the sick and dead should be organized, and the men composing it encouraged by being placed in the special class. It is important to organize this corps *early*, as it cannot be improvised when an epidemic is at its height. Immigrants to the works from surrounding Indian States and from any area where epidemic disease is known to be likely to be prevalent should be placed in a quarantine camp for the first ten days after their arrival and given work separately from the rest of the workers so far as possible.

VI.—HOSPITALS.

32. A hospital will be attached to each Public Works Department famine relief work. The following accommodation should at first be provided:—

(1) One dispensary with quarters for a Sub-Assistant Surgeon—35′ × 20′.
(2) One male ward 70′ × 10′.
(3) One female ward—70′ × 10′.
(4) Two segregation wards for infectious or contagious diseases—40′ × 10′.
(5) One isolation ward—10′ × 10′ situated 200 paces to leeward of general wards.
(6) One maternity ward—70′ × 10′.
(7) Quarters for one compounder and one peon—30′ × 14′.
(8) One cook-house with store-room, if necessary.

This accommodation may be subsequently increased as required, but the additional wards or quarters should not be erected without obtaining the previous sanction of the Executive Engineer and the Collector, except in case of an epidemic when additional isolation wards should be erected by the Charge Officer as required.

33. The wards should face north and run east and west. They should be ridge-roofed 7 feet high at the sides and 10 feet high in the centre. A space of one foot in each side way immediately under the eaves shall be kept open for ventilation and covered by moveable flaps. The eaves should project 1 foot 6 inches and the door opening should be 6 feet high. The width of the ward should be 10 feet. The length should be sufficient to allow 7 feet to each bed, or 70 square feet of floor space to a patient, which includes a passage of 3 or 4 feet in width between the row of cots and the front wall. Each ward will provide accommodation for 10 patients, the length thus being 70 feet. One relation or friend should be allowed to tend each patient for such period as the medical officer may deem necessary and should be granted the dependent's allowance.

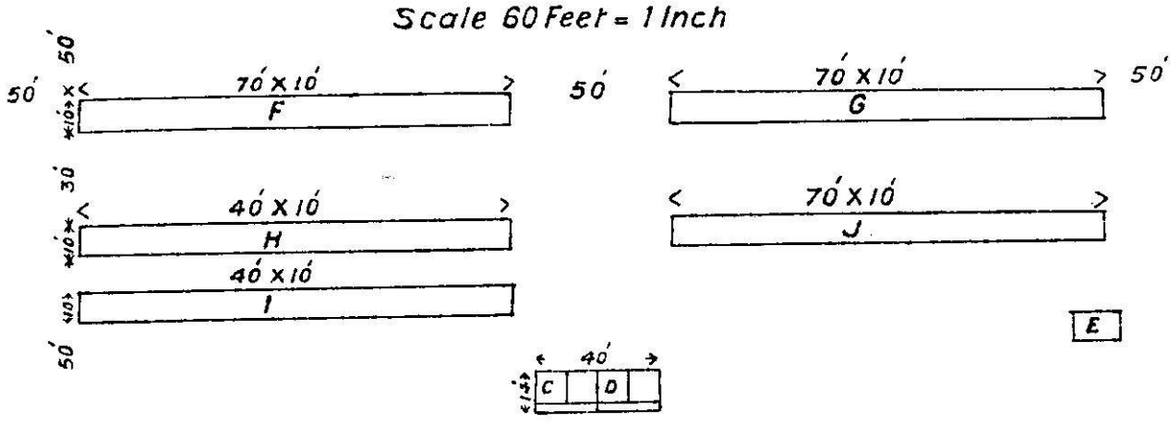
34. Infected cholera and small-pox wards must be burnt down when no longer required and the site covered with quicklime, which should then be slacked. Latrine accommodation in the form of screened trenches should be provided to the leeward of the hospital and at a distance of about 200 feet from the nearest ward.

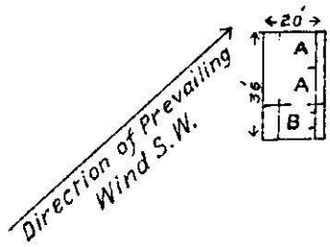
35. The Executive Engineer should arrange to keep each Charge Officer supplied with a stock of cots, mats, hospital clothing and blankets for issue on indent to the medical officer. Cots may often be cheaply made up on the work itself.

36. Destitute convalescents, who are without sufficient clothing of their own, should on leaving hospital be allowed to retain the hospital clothing they have received.

GENERAL PLAN OF HOSPITAL

Scale 60 Feet = 1 Inch





REFERENCE

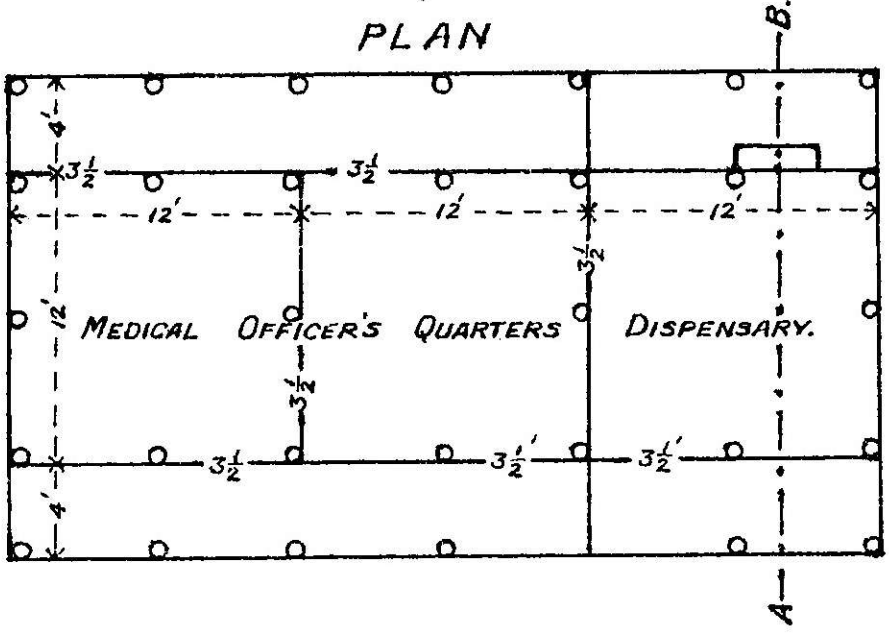
AA	Medical Officers Quarters two Rooms		35' X 20'
B	Dispensary		
C	Compounders' Quarters each		10 X 10
D	Peons Quarters		10 X 10
E	Cook room		10 X 20
F	General Wards	70 X 10	for 10 Males
G	Do	70 X 10	" 10 Females
H	Segregation Ward	40 X 10	" 5 Males
I	Do	40 X 10	" 5 Females
J	Maternity Ward	70 X 10	" 10 Do.
	Isolation Ward	10 X 10	

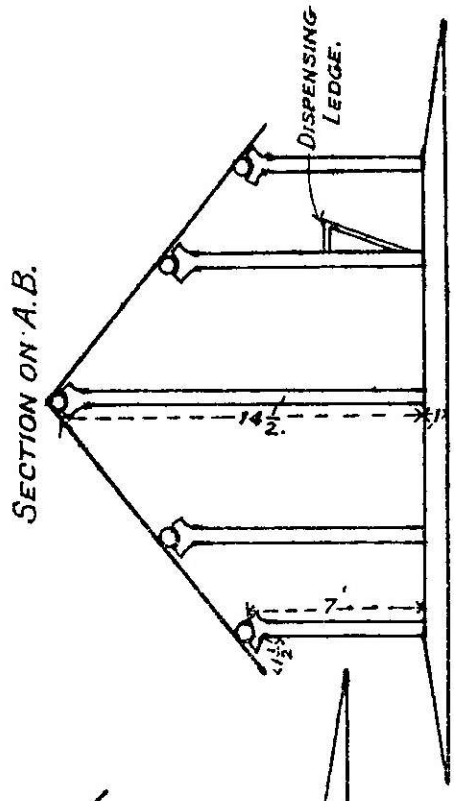
DETAILS OF HOSPITAL BUILDINGS.

SCALE 8 FEET-1 INCH.

MEDICAL OFFICER'S QUARTERS & DISPENSARY

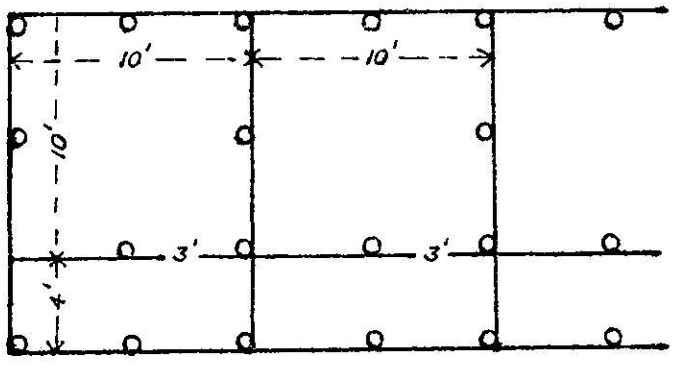
PLAN

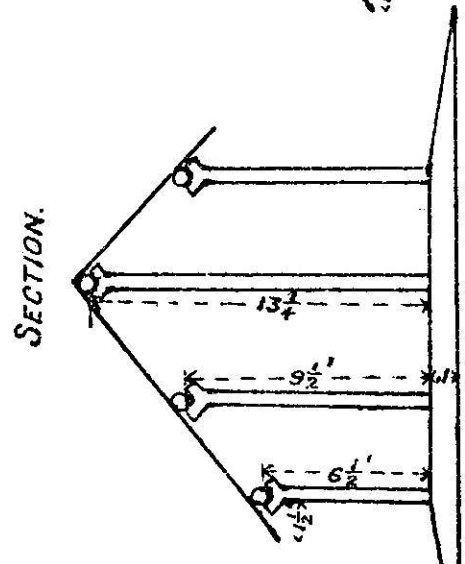




QUARTERS FOR COMPOUNDER & PEON.

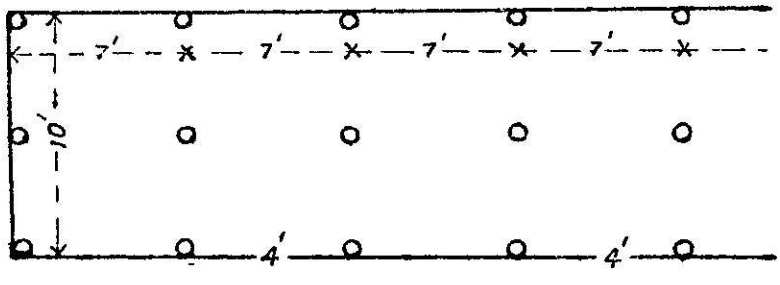
PLAN.

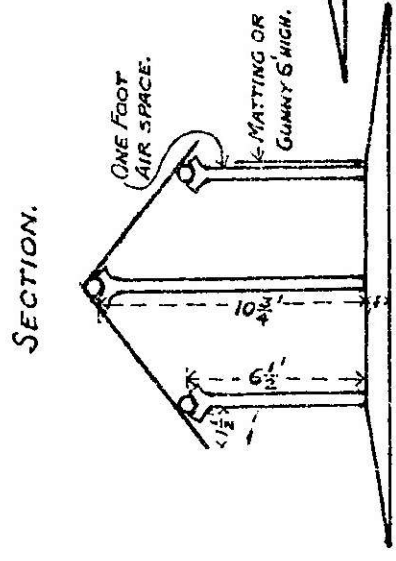




GENERAL WARDS

PLAN.





VII.—Market Arrangements

37. Every large work should have a market in a convenient and sanitary situation. The shops should be placed in two rows, facing each other, with a 30 feet roadway between them. Permission to erect shops should be given to all respectable grain-dealers and others applying for it. Food likely to give rise to indigestion and diarrhœa and articles, such as sweetmeats, which the relief workers are not in position to purchase, should be rigidly excluded. Meat should be slaughtered at a place specially selected by the Charge Officer and should be exposed for sale at a distance from the grain market, particular care being taken that no diseased or putrid meat is sold. Persons found using short weights and measures or charging more than the market rates for any article of food should be warned by the Charge Officer and on a repetition of the offence should be expelled from the camp. The weights and measures used by the various shop-keepers should be tested from time to time.

VIII.—Destruction of Flies

38. Every effort should be made to combat the danger and nuisance caused by the hordes of house flies, which usually infest famine camps, particularly in the vicinity of kitchens, hospitals, and bazars where food is sold.

39. Careful attention should be paid to the kitchen and hospital latrines, all excrement being completely covered with a layer of dry earth directly it is voided.

40. No accumulation of rubbish should be permitted to exist in or round the camp. All sweepings and refuse should be burnt as soon as they are collected.

41. All kitchen refuse should be kept in receptacles with closely fitting covers until it is removed. Soiled dressings in the hospital should be similarly protected.

42. All food-stuffs, whether in the kitchen; hospital or exposed for sale in the bazar, should be covered with pieces of muslin cloth.

43. A supply of crude oil shall always be kept in stock with the Charge Officer for use in latrines on heaps of refuse and any other fly-breeding place.

IX.—Organization of Relief Labour—The Gang

44. A large red flag on a tall bamboo will mark the point where persons seeking relief will assemble. This should be situated at a distance of about 200 yards from the head-quarter camp. Here the Charge Officer will attend daily for the purpose of classifying and forming gangs, after the new-comers have been registered. The time for this will be the early forenoon. Tools will then be issued and the new gangs put to work in the afternoon. The necessary mustering karkuns must be on the spot to take over their gangs and issue receipts for the tools.

45. The storekeeper will have his hut near the admission station, inside a thorn enclosure, where he will keep his stock of tools and petty stores. A chaukidar will always be on duty at the entrance of this enclosure to see that nothing is removed without authority.

46. The Charge Officer will visit the admission station and form the gangs selecting people from the same villages and same families as far as possible to be members of one gang, which should consist of 50 workers or as near that figure as possible. The workers should be then mustered by the mustering karkun in whose charge the gang is to be. The dependents, excepting the children in arms of workers, should be sent with a separate list to the kitchen superintendent by whom they will be mustered. Against the head of each family in the working gang list the number of dependents he has in the kitchen should be noted and against the dependents in the kitchen muster roll the number of working gang to which they pertain. The ganger should be selected with due regard to the wishes of the gang and will be given a badge, with the gang number marked thereon, to be worn on his arm, and also a gang flag with a corresponding number. He will be tasked as a B class worker, while entitled to the A class wage, and made to do his full share of the work. He should be an intelligent man. If a gang after being put to work constantly fails to complete its task, the ganger should be changed.

47. The provisions of sections 97—100 relating to new-comers, weakly persons, nursing mothers, immigrants and aboriginal tribes should receive most careful attention when a gang is being-formed. Due provision for filling up depleted gangs should be made.

48. As soon as the gang has been made over to the karkun, its distinguishing number and the ganger's and mustering karkun's names should be entered by the Charge Officer in his note-book. The nominal muster-roll should, on completion and after check, be made over in a tin case to the ganger to be kept by him.

bag to the ganger, inform him as to what the contents should be. The ganger will then open the bag, count the money and sign or make a mark with his left thumb opposite the number of his gang in the mustering karkun's daily abstract (Form 13). The distribution of the wages amongst the members of the gang should then at once take place. The wages of absent member of the gang should be refunded to the Charge Officer and entered by him in his register of arrears of wages. In exceptional cases, where the work has not been measured up in time for calculation of the wages earned to be made and when the Charge Officer has issued a sum *estimated* to cover the day's wages, the mustering karkun should hand over to the ganger only the exact sum found to have been earned and return the balance to the Charge Officer.

58. The Charge Officer and all inspecting officers shall pay particular attention to the proper up-keep of the muster-roll and be especially on their guard against the introduction of false rolls. If a mustering karkun is found to be constantly making alterations in his roll he should be dismissed. No erasures are to be allowed, all corrections found necessary being made by drawing a line through the incorrect entry and making a fresh entry above it All such corrections should be initialled by the Charge Officer or an inspecting officer. If the Charge Officer fails to prevent falsification of muster-rolls, he should ordinarily be got rid of.

59. The constant and systematic taking of check-measurements is another point to which special attention should be directed to prevent complicity between the karkuns and the work agents. This should be done by the Public Works Sub-Divisional Officer himself, as already laid down, the Executive Engineer arranging to check a certain proportion of the Sub-Divisional Officer's measurements, either himself or by deputy.

60. Work should go on ordinarily for about nine hours a day, beginning half an hour after sunrise and stopping half an hour before sunset. The hours for beginning and stopping work should be announced by the blowing of a horn. There should ordinarily be an interval of rest in the middle of the day, varying from two to three hours according to the season. The best time for the distribution of wages, so as least to interfere with the work, will be at or about noon.

61. Children in arms of female workers should be collected together during work hours and placed in charge of a nurse in some shady place near the gang, so as to prevent their interfering with the workers.

62. The workers should not be allowed to take the tools home after the day's work. All tools should be stacked every evening in suitable enclosures and under suitable guard and the mustering karkuns should be held responsible for them.

63. The Executive Engineer must see that no unnecessary clerical work is thrown on the Charge Officer.

XII.—Duties of Inspecting Officers

64. Famine Relief Works charges should be inspected as often as possible by gazetted officers of the Public Works Department and the other officers referred to in section 44 of the Code. The particular points to which the attention of an inspecting officer should be directed are indicated in the same section. He should not confine himself to criticism, but should as far as possible rectify at the time all errors and defects discovered by him.

Standard Tables of Tasks on Famine Relief Works

(To accompany Appendix V)

Explanation of the calculation

(1) The tasks are given to the nearest cubic feet: the leads given are "reduced" leads in feet.

(2) "reduced" lead (L) equals the horizontal lead *plus* 12 times the lift in feet.

(3) The carriers' tasks are based on the following units, which are equivalent to carrying so many cubic feet of soil over a one-foot lead and may be called the carrying duty (D)—*viz.*, Class B, 18,000 units; Class C, 12,000 units; and Class D, 6,000 units.

(4) The carrying task for each class of workers is arrived at by dividing the appropriate duty by the "reduced" lead *plus* 110 (to allow for the initial effort), *i. e.*, the carrying task $= \frac{D}{L+110}$.

(5) If K be the digging task and D the carrying duty for Class B, the combined digging and carrying task for Class B is calculated by the formula $\frac{D \times K}{D+K(L+110)}$.